Charles Darwin University

Final Examination

Family Name						
Given Name/s						
Student Number						
Teaching Period	Semester 2, 2017					

SBI173 – Microbiology	DURATION	
	Reading Time:	10 minutes
	Writing Time:	120 minutes

INSTRUCTIONS TO CANDIDATES

Section A must be answered on the FINAL EXAMINATION MULTIPLE CHOICE ANSWER SHEET provided. Please ensure that your name and student number are clearly indicated on your Answer Sheet and at the top of this examination paper.
Section B must be answered in the Exam booklet provided.
1.2 Note that questions ARE NOT of equal value.
1.3 Read ALL questions carefully.
1.4 Do not commence writing until instructed to do so.

EXAM CONDITIONS

You may begin writing from the commencement of the examination session. The reading time indicated above is provided as a guide only.

This is a CLOSED BOOK examination

Any non-programmable calculator is permitted

No handwritten notes are permitted

No dictionaries are permitted

ADDITIONAL AUTHORISED MATERIALS	EXAMINATION MATERIALS TO BE SUPPLIED
No additional printed material is permitted	1 x 20 Page Book 1 x 4-Multiple Choice Answer Sheet 2 x Scrap Paper Faculty/School Multiple Choice Answer Sheet

THIS EXAMINATION IS PRINTED DOUBLE-SIDED.

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Section A

Multiple Choice Questions

Total No of Marks for this section: fifty (50)

This section should be answered on the Answer Sheet provided. Please ensure that your name and student number have been written on the Answer sheet and place in the completed answer Booklet.

Each question is worth 1 mark. Suggested Time allocation for Section A: 50 mins

Section B
Short answer
Total Number of marks for this section: Sixty (60)

This section should be answered in the exam book provided.
Questions are **NOT** of equal value see each question for mark allocation.

Suggested Time allocation for Section B: 70 mins

Question 1

Outline two major discoveries or innovations from the "Golden Age of Microbiology". Include in your answer the date (i.e. year), and the person responsible.

(Marks: 4)

Question 2

Join the words/phrases in column A to the best matches in column B.

Column A	Column B
1. Refraction	a) 3D fluorescence microscopy
2. Phase-contrast microscopy	b) Scanning tunnelling microscopy
3. Staining with heavy metal salts	c) Differences in refractive index converted to differences in brightness
4. Resolution less than the size of an atom.	d) Has positive charge
5. Confocal microscopy	e) Transmission electron microscopy
6. Reduction of transmission.	f) Has negative charge
7. Basic dye	g) Basis for how lenses work
8. Acidic dye	h) Absorption

(Marks: 4)

Question 3

Draw a diagram of the structure of the cell envelope of Gram-negative bacteria.

(Marks: 5)

Question 4

How do bacteria move towards attractants and away from repellants?

(Marks: 6)

Question 5

In relation to biochemistry, define the terms “oxidation” and “reduction”.

(Marks: 6)

Question 6

Join the words/phrases in column A to the best matches in column B.

Column A	Column B
1. Photosystem 1	a) Beginning of Krebs cycle
2. Oxaloacetic acid + Acetyl CoA	b) ATP generation without light or cytoplasmic membrane involvement
3. Photosystem II	c) Oxygen
4. Extracts energy from proton gradient	d) ATPase
5. Calvin-Benson cycle	e) Generates ATP + NAPDH
6. Terminates at pyruvate	f) Part of photosynthesis that does not involve light
7. Excellent electron acceptor	g) Generates ATP
8. Substrate level phosphorylation	h) Glycolysis

(Marks: 4)

Question 7

Describe the growth phases of bacterial batch culture. Include in your answer a graph that incorporates "cell number" and "time information".

(Marks: 5)

Question 8

What happens at the DNA replication fork?

(Marks: 6)

Question 9

Joint the words/phrases in column A to the best matches in column B.

Column A	Column B
1. Proteobacteria	a) Encompasses many Gram-negative bacteria
2. Actinobacteria	b) *Chlamydia*
3. Encompasses the endospore forming bacteria	c) Firmicutes
	d) The Black Death
	e) *Helicobacter*
4. Fixes nitrogen	f) High %G+C Gram-positive bacteria
5. Insect associated	g) *Azospirillum*
6. *Yersinia*	h) *Wolbachia*
7. Always live inside host cells	
8. Australian Nobel prize	

(Marks: 4)

Question 10

In terms of basic characteristics and large scale evolutionary history and diversity, how would you define:

a. fungi
b. protozoa
c. algae?

(Marks: 6)

Question 11

With respect to epidemiology, define the terms “incidence”, “prevalence” and “sporadic”.

(Marks: 6)

Question 12

Joint the words/phrases in column A to the best matches in column B.

Column A	Column B
1. Cytokine	a) Immune-based diagnostic method
2. C5a	b) Breakdown is a bacterial pathogenicity mechanism
3. Inflammation	c) Epitope binding
4. V region	d) IgA
5. Mucosal surfaces	e) Antibody-dependent
6. Humeral	f) Triggered by damage
7. T_{reg} cells	g) Combat autoimmunity
8. ELISA	h) Chemical messenger

(Marks: 4)